

New and interesting mites
from the Geneva Museum LXV.
Oribatids of Sumatra (Indonesia) I
(Acari: Oribatida)

by

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With 66 figures

ABSTRACT

New and interesting mites from the Geneva Museum LXV. Oribatids of Sumatra (Indonesia) I (Acari: Oribatida). — Fourteen species are identified from Sumatra, ten of them are described as new to science. For two species it was necessary to establish new genera: *Sumatrotritia* gen. n. (Euphthiracaridae) and *Reteremuloides* gen. n. (Eremobelbidae).

INTRODUCTION

Dr. B. Hauser, the well-known soil zoologist, makes great efforts to increase the knowledge on the soil fauna of the Oriental region, especially in South-East Asia, which is from the acarological point of view the least explored faunal region. In his earlier expeditions, he collected mainly in Sabah (North Borneo) (MAHUNKA 1987a, b, 1988; MAHUNKA & MAHUNKA-PAPP 1988).

The principal aims of his present expedition, realized in collaboration with Dr. C. Lienhard, was to make extensive collecting in Sumatra. Dr. W. Diehl, the renown physician and lepidopterologist, contributed with his hospitality and continuous help very much to the success of this trip.

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The collected soil samples yielded a very interesting mite fauna. My first contribution proposes to discuss 14 species, of which 10 are new to science, two even representing two new genera.

Special mention should be made that this material contains a new species of the genus *Hypochthoniella*, which belongs to a so far monotypic family, being the second known species. Therefore doubts about the cosmopolitan distribution of the type-species *H. minutissima* (Berl., 1904) are raising.

From the zoogeographical point of view the discovery of *Rhysotritia ardua* is highly interesting.

Holotypes and paratypes of new taxa described are deposited in the Muséum d'Histoire naturelle de Genève (MHNG), paratypes also in the Hungarian Natural History Museum, Budapest, with identification number of the specimens in the Collection of Arachnida (HNHM).

LIST OF LOCALITIES

- Sum-85/30: SUMATRA (Sumatera Utara: Simalungun): sur la route en provenance de Pematangsiantar, 18 km avant Prapat, lieu-dit «Ainuli», forêt dans la chaîne montagneuse Bukit Parasat, derrière la station «Holzweg Nr. 2 du Dr. Diehl», forêt primaire autour de l'école forestière, 1000 m, prélèvement de sol dans les angles formés par les contreforts de grands arbres; 14.XI.1985, leg. B. H. (B) [= extraction par appareil BERLESE à Pematangsiantar (Sumatra)].
- Sum-85/33: SUMATRA (Sumatera Utara: Deli Serdang): réserve naturelle de Tinggi Raja près de Negrilodok dans la région de Tebingtinggi, forêt primaire, prélèvement de sol dans les angles formés par les contreforts d'un très grand arbre, 420 m; 15.XI.1985, leg. B. H. (B).
- Sum-85/39: SUMATRA (Sumatera Utara: Deli Serdang): Sibolangit sur la route de Medan à Brastagi, jardin botanique, prélèvement de sol dans les angles formés par les contreforts de grands arbres, 520 m; 18.XI.1985, leg. B. H. (B).
- Sum-85/47: SUMATRA (Sumatera Utara: Deli Serdang): forêt de *Pinus merkusii* près de la route de Brastagi à Sibolangit, 1400 m; prélèvement de sol sous *Pinus merkusii*; 19.XI.1985, leg. B. H. (B).
- Sum-85/49: SUMATRA (Sumatera Utara: Langkat): réserve naturelle de Bukit Lawang près de Bohorok, forêt primaire le long de la rivière, 180 m, prélèvement de sol dans les angles formés par les contreforts d'un grand arbre; 20.XI.1985, leg. B. H. (B).
- Sum-85/54: SUMATRA (Sumatera Barat): grotte «Ngalau Indah» près de la localité Pakan Sinayan (à 2 km de Payakumbuh), 530 m; 24.XI.1985, leg. C. L.

LIST OF IDENTIFIED SPECIES

Eniochthoniidae Grandjean, 1947

Hypochthoniella sumatrana sp. n.

Locality: Sum-85/30.

Euphthiracaridae Jacot, 1930

Microtritia tropica Märkel, 1964.

Localities: Sum-85/30: 7 specimens; Sum-85/47: 1 specimen.

Rhysotritia ardua ardua (C. L. Koch, 1841).

Locality: Sum-85/30: 3 specimens

Sumatrotritia inusitata gen. n., sp. n.

Locality: Sum-85/30

Eremobelbidae Balogh, 1961

Reteremuloides bifurcatus gen. n., sp. n.

Localities: Sum-85/30; Sum-85/49

Carabodidae C. L. Koch, 1837

Congocepheus hauseri sp. n.

Locality: Sum-85/49

Otocepheidae Balogh, 1961

Acrotocepheus diehli sp. n.

Localities: Sum-85/30; Sum-85/39

Acrotocepheus excelsus Aoki, 1965

Locality: Sum-85/30; 2 specimens

Otocepheus plumosus sp. n.

Locality: Sum-85/30

Dolicheremaeus duplicatus sp. n.

Locality: Sum-85/39

Dolicheremaeus sumatranus sp. n.

Localities: Sum-85/39; Sum-85/49

Suctobelbidae Grandjean, 1954

Rhynchoppia widagdoi sp. n.

Locality: Sum-85/39

Zetomotrichidae Grandjean, 1934

Zetomotrichus lienhardi sp. n.

Locality: Sum-85/54

Oribatellidae Jacot, 1925

Lamellobates orientalis Csiszár, 1964

Locality: Sum-85/33; 3 specimens

DESCRIPTIONS

Hypochthoniella sumatrana sp. n.

Measurements: Length: 310-342 μm , width: 174-184 μm .

Prodorsum: All setae simple, setae *ro*, *le*, *in* and *exa* nearly equal in length, setae *exp* slightly shorter. Sensillus (Fig. 3) directed outwards, gradually thickened distally, with sharply pointed apex.

Notogaster: Similar to that of the European form. Setae f_1 and h_1 slightly dilated basally and shorter than c_1 or d_1 (Fig. 1).

Coxisternal region: Sternal apodemes not reaching posterior margin of sternal plate (Fig. 2). Epimeral setae thin and simple, setal formula: 3-1-3-4.

Anogenital region: Genital plates wide. Aggenital plate divided into three parts (Fig. 4), aggenital setae arising on the small median one. Anogenital setal formula: 10-1-2-3.

Material examined: Holotype: Sum-85/30; 8 paratypes: from the same sample. Holotype and 5 paratypes: MHNG, and 3 paratypes (1224-PO-87): HNHM.

Remarks: The species collected in Sumatra stands very near to the type-species from Europe: *H. minutissima* (Berlese, 1904). I compared the series of the new species with Hungarian and Swiss specimens (Figs 5, 6) and found only the following differences:

H. minutissima (Berl., 1904)

1. Sensillus (Fig. 5) gradually narrowed distally, thin, with 11-14 long branches.
2. Aggenital plates divided into two parts. Aggenital setae arising on the anterior large part (Fig. 6).

H. sumatrana sp. n.

1. Sensillus (Fig. 3) thick with 9-10 short branches.
2. Aggenital plate divided into three parts (Fig. 4). Aggenital setae arising on the small median part.

Sumatrotritia gen. n.

Diagnosis: Family Euphthiracaridae. Aspis and notogaster with strong longitudinal striation. Bothridial scale situated above and behind the bothridium. Two interlocking triangles present. Four pairs of genital (three pairs of them very long), two pairs of aggenital, two pairs of anal and five pairs of adanal setae (three anterior pairs minute) present. Palpus (Fig. 14) 4-segmented, its trochanter very small, setal formula: 0-2-1-9. All legs monodactylous and every trochanter bearing 1 seta. Setal formula of legs: I (Fig. 15): 1-2(?) - 5-6-18-1; IV (Fig. 13): 1-1-1-3-10-1.

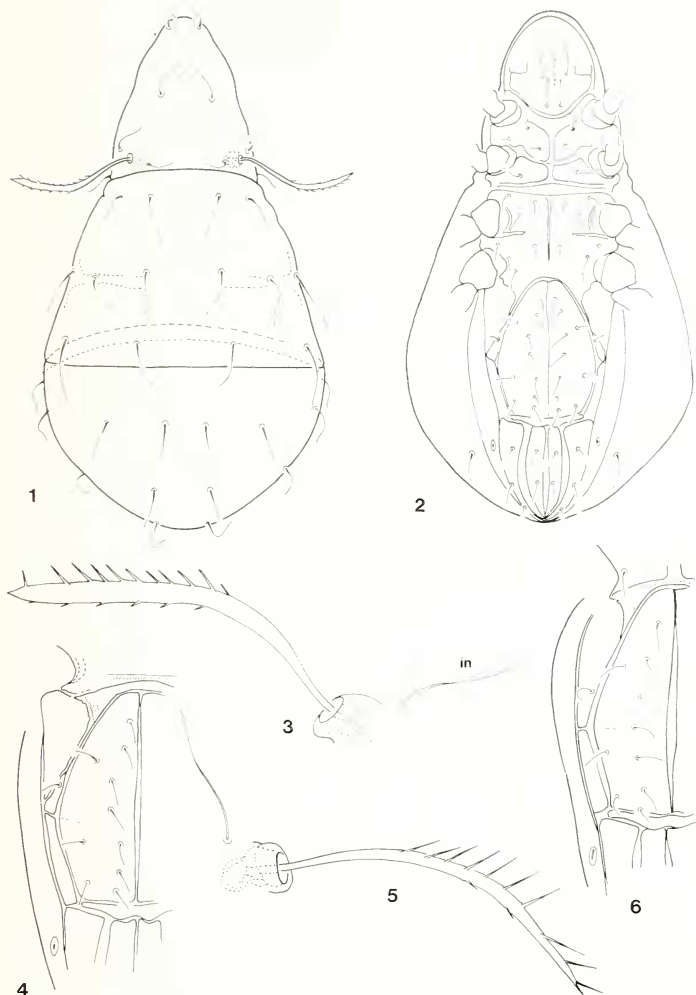
Type species: *Sumatrotritia inusitata* sp. n.

Remarks: On the basis of the anogenital and leg chaetotaxy the new taxon stands very far from all heretofore known Euphthiracarids. Only two genera are known in this family with two interlocking triangles (*Euphthiracarus* Ewing, 1917 and *Brasilotritya* Märkel, 1964), but their bothridial scale originates under the bothridium, their trochanters III and IV have two setae and the relation between palpus and legs is different. By the number of anogenital setae (4 pairs of genital setae) the new genus is distinguished from all related taxa (with the exception of *Microtritya* Märkel, 1964) all having 7-9 pairs of genital setae.

Sumatrotritia inusitata sp. n.

Measurements: Length of aspis: 370 μ m, length of notogaster: 737 μ m, height of notogaster: 567 μ m.

Aspis (Fig. 11): With one short anterior median crista and one lateral carina on either side. Setae — excepting the short, spiniform seta *ex* — long and filiform. Sensillus also long, with slightly dilated end (Fig. 9).



FIGS 1-6.

Hypochthoniella sumatrana sp. n. — 1: body in dorsal view, 2: body in ventral view, 3: sensillus, 4: genital and aggenital plates.

Hypochthoniella minutissima (Berlese, 1904) — 5: sensillus, 6: genital and aggenital plates.

Notogaster (Fig. 7): Fourteen pairs of notogastral setae, c_1 , c_2 , c_3 , cp , h_3 and p_3 of different lengths, filiform, all others much shorter and blunter at tip. Four pairs of lyrifissures present (ih was not observable). Terminal fissures long.

Coxisternal region: Epimeral setal formula: 3-0-1-1, seta lc , $3a$, $4a$ very long and strong, $1a$ and $1b$ very short.

Anogenital region (Fig. 8): Anterior pairs of genital setae minute, the others very long and strong. Setae ad_1 originating in lateral position. Lyrifissures iad absent. Seven pairs of setae present on the ano-adanal plates. The anterior three pairs (homology uncertain) minute, the posterior four pairs very long.

Material examined: Holotype: Sum-85/30: MHNG.

Remarks: As indicated in the generic diagnosis the new species stands very far from all other members of the family.

Reteremuloides gen. n.

Diagnosis: Family Eremobelbidae. Rostrum incised. Costula absent, lamellar setae arising on tubercles, near to rostral setae. Prodorsum deeply excavated laterally to receive legs I. Strong crista present in the exobothridial region. Sensillus bifurcate. Whole surface of the dorsal and ventral region with polygonate sculpture, cerotegument present. Eleven pairs of notogastral setae. Pedotecta I very large, pedotecta II present but narrow; discidium also very large, it is protruding behind legs IV. Epimeral setal formula: 3-1-3-3. Anogenital setal formula: 6-2-2-8. Chelicera normal. Rutellum with sharply pointed inner and outer teeth. Setal formula of palpus: 0-2-1-3-9-1. Legs normal, of eremuloid type, setal formula of leg I: 1-5-4-6-21-1.

Type species: *Reteremuloides bifurcatus* sp. n.

Remarks: The status and the true relationship of the new genus remain uncertain until the revision of the superfamily Eremuloidea Grandjean, 1965. On the basis of the presence of pedotecta II and the ventral neotrichy, the form of the legs and the mouthparts the new genus may be ranged into the family Eremobelbidae, where it is resembling the genus *Reteremulus* Balogh et Mahunka, 1966. The new genus is distinguished from all the known genera of the superfamily by the shape of the prodorsum and the large discidium.

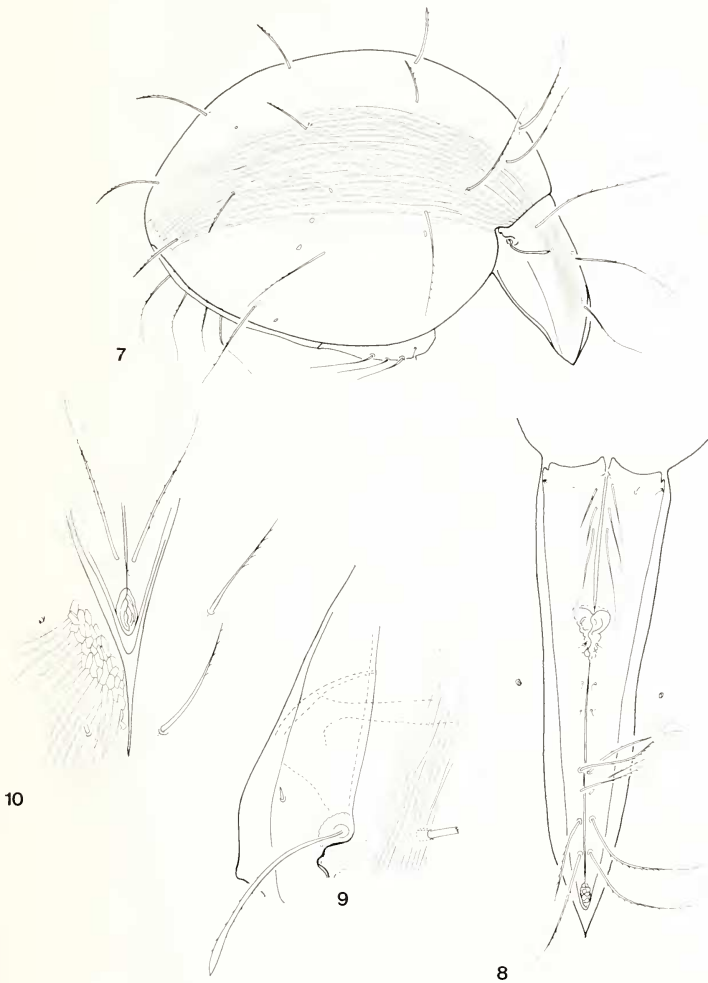
Reteremuloides bifurcatus sp. n.

Measurements: Length: 325-351 μ m, width: 187-208 μ m.

Prodorsum: Rostral incision reaching transversal line between the rostral setae (Fig. 18). Lamellar setae arising on well-developed tubercles. All notogastral setae simple, their ratio $in > le > ro > ex$. Setae ex arising on the lateral crests. Sensillus bifurcate and set very near to bothridium (Fig. 19).

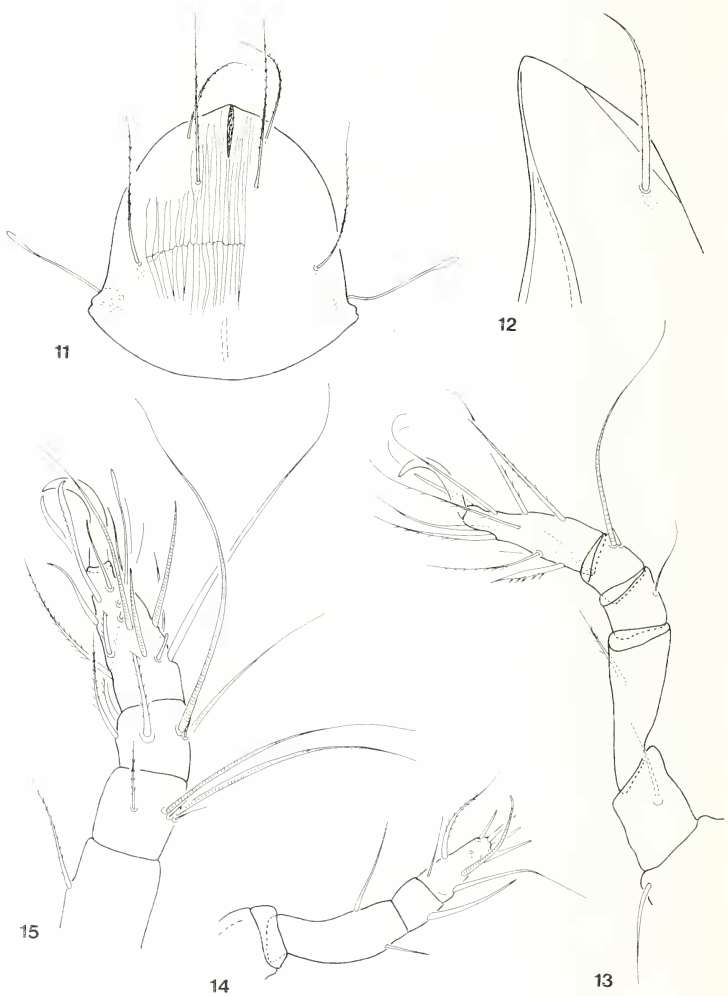
Notogaster: Eleven pairs of flagellate notogastral setae present, among them c_2 and p_1-p_2 shorter than the others (Fig. 16).

Lateral part of podosoma: Pedotecta I very large, with a high protrusion near to the lateral crest of prodorsum. Pedotecta II narrowed laterally. Discidium very large, its lateral part directed far outwards.



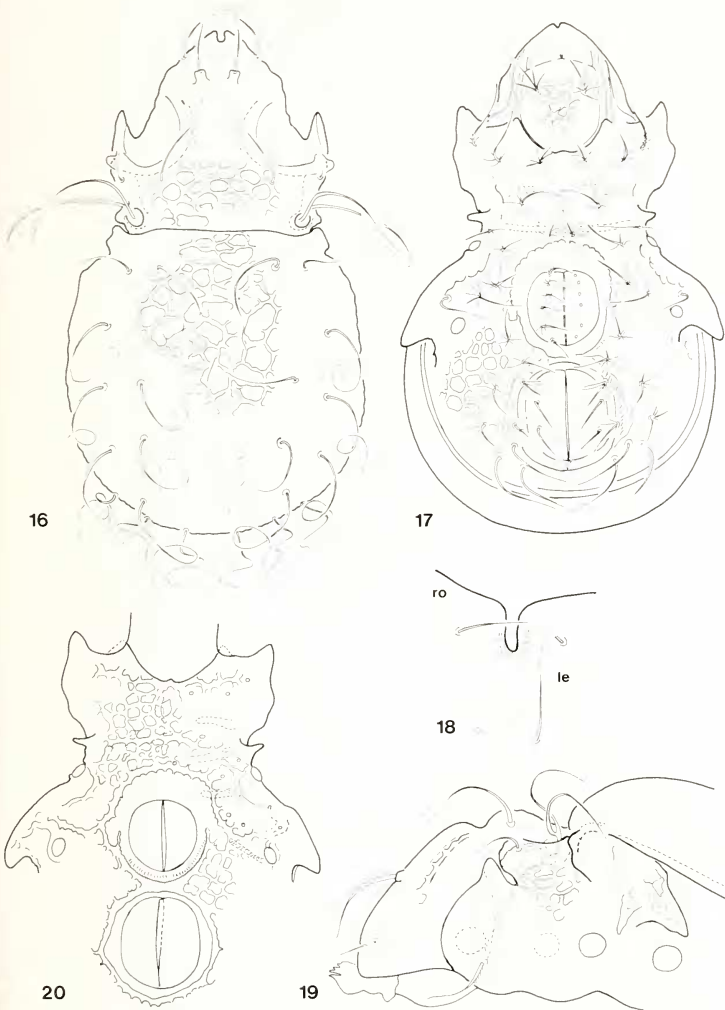
FIGS 7-10.

Sumatrotritia inusitata gen. n., sp. n. — 7: body in lateral view, 8: anogenital region, 9: trichobothrium, 10: posterior end of body.



FIGS 11-15.

Sumatrotritia inusitata gen. n., sp. n. — 11: aspis in dorsal view, 12: rostral part of prodorsum, 13: leg IV, 14: palpus, 15: leg I.



FIGS 16-20.

Reteremuloides bifurcatus gen. n., sp. n. — 16: body in dorsal view, 17: body in ventral view, 18: rostral incision, 19: lateral part of prodorsum, 20: ornamentation of the coxisternal region.

Gnathosoma: Mentum with polygonate sculpture similar to the rest of body surface. Setae *hy* stellate. Rutellum divided anteriorly, like a beak in ventral view. Its outer tooth serrate laterally (Fig. 24). Palpus as shown in Fig. 22.

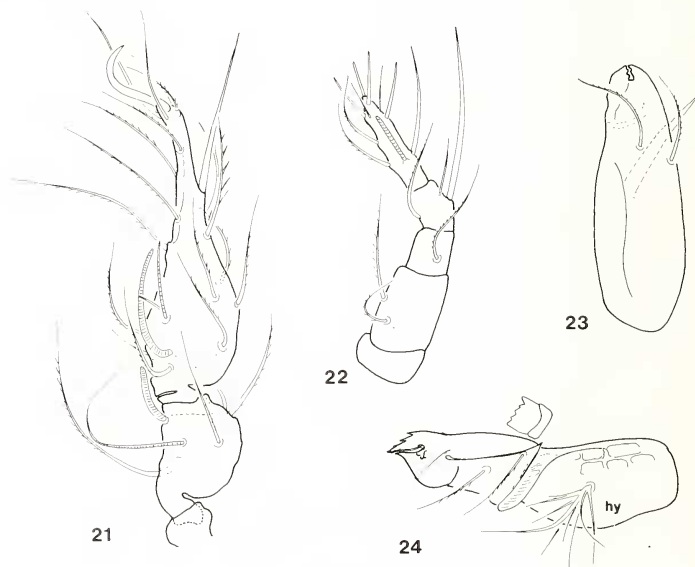
Epimeral region: All epimeral setae — excepting setae *1c* and *4c* — stellate. Apodemes very short, borders not visible, but some stronger transversal lines in the sculpture are visible (Fig. 20). Epimeral region well excavated medially, genital aperture opening between legs IV.

Anogenital region: Genital and anal apertures framed by well-observable crests (Fig. 17). Two pairs of “adanal” setae arising from these crests. Genital and aggenital setae stellate, anal setae and three pairs of adanal ones normal, all other also stellate.

Legs: The form of joint typical for this superfamily, tarsus and tibia dilated basally. Setae *p* of leg I (Fig. 21) different in lengths, setae *ft'* much stronger than *ft''*.

Material examined: Holotype: Sum-85/30; 2 paratypes: from the same sample; 2 paratypes: Sum-85/49. Holotype and 2 paratypes: MHNG and 2 paratypes (1225-PO-87): HNHM.

Remarks: The diagnosis of the new genus shows, that this species stands very far from all the heretofore known Eremuloid taxa.



FIGS 21-24.

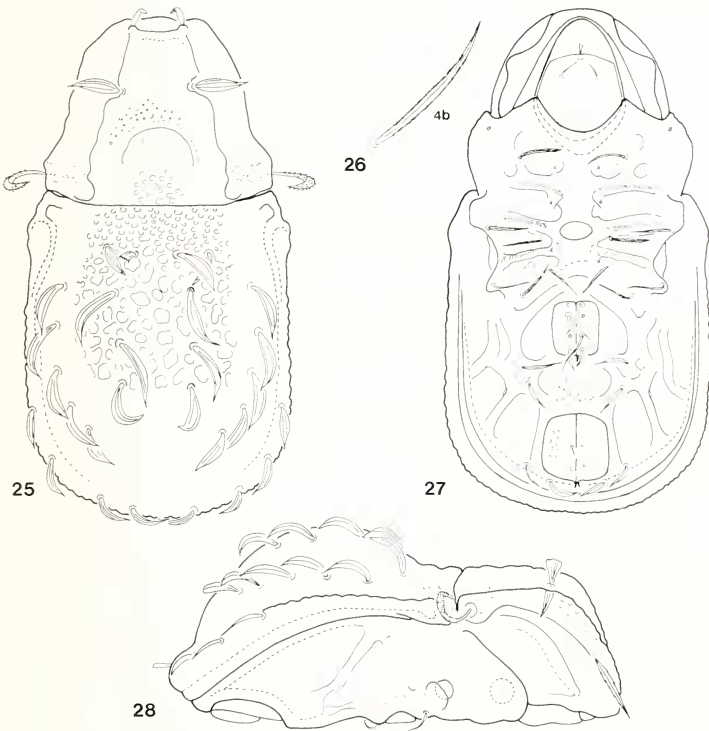
Reteremuloides bifurcatus gen. n., sp. n. — 21: leg I, 22: palpus, 23: chelicera, 24: infracapitulum in lateral view.

Congocepheus hauseri sp. n.

Measurements: Length: 583-640 μm , width: 315-373 μm .

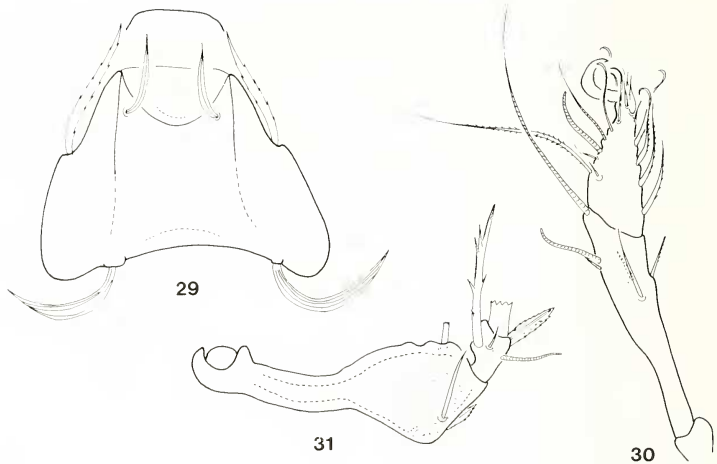
Prodorsum: Rostral setae arising on a transverse lath, phylliform. Lamellar setae narrow resembling a leaf of a peach tree, their margin scarcely dentate (Fig. 29). Interlamellar setae wide, phylliform, arising on tubercles, surface with three veins. Sensillus unicate, its outer surface densely spinose. Tutorium present. Posterior third of interlamellar region with a deep, half-moon-shaped, anteriorly well-framed cavity. Surface before and behind it foveolate or alveolate. Posterior part of prodorsum concave (Fig. 28).

Notogaster: Dorsosejugal suture straight, median part of notogaster well protruding (Fig. 25), its anterior part with a hollow. Fourteen pairs of phylliform



FIGS 25-28.

Congocepheus hauseri sp. n. — 25: body in dorsal view, 26: seta 4b, 27: body in ventral view, 28: body in lateral view.



FIGS 29-31.

Congocephus hauseri sp. n. — 29: prodorsum in anterior view, 30: tibia and tarsus of leg I, 31: femur and genu of leg I.

notogastral setae present, similar to interlamellar ones. Ornamentation of the surface characteristic, anteriorly smaller alveoli, in the middle large spots present. Lateral margin with rugae.

Coxisternal region: All four pairs of epimeres well framed by epimeral borders. Between the sejugal and third borders an oval, median spot present (Fig. 27). Epimeral surface with some irregular spots or alveoli. Epimeral setal formula: 3-1-3-3. Among epimeral setae *1a*, *2a* and *3a* minute, others slightly widened like a willow leaf, their margin roughened (Fig. 26).

Anogenital region: Ventral plate divided by strong chitinous laths, genital and anal apertures also framed by them. Genital and aggenital setae very long, preceding ones slightly widened. Anal setae short, spiniform, adanal ones resembling notogastral setae. Posterior end of anal plate with a long spine. Lyrifissures *iad* originating far from anal aperture.

Legs: Ultimate setae (*u*) of tarsi of all legs (Fig. 30) dilated basally, their end long and sharply pointed at tip. Setae *lv''* of genu I (Fig. 31) and II phylliform, rounded anteriorly. Seta *lv'* of genu II very long, resembling a strong spine.

Material examined: Holotype: Sum-85/49, 1 paratype: from the same sample. Holotype: MHNG and paratype (1226-PO-87): HNHM.

Remarks: The generic position (cf. MAHUNKA 1986) of this species is rather uncertain, but its dorsosejugal hollow, the protruding median part of the notogaster, the position of the notogastral setae and the structure of the ventral plate range it into the

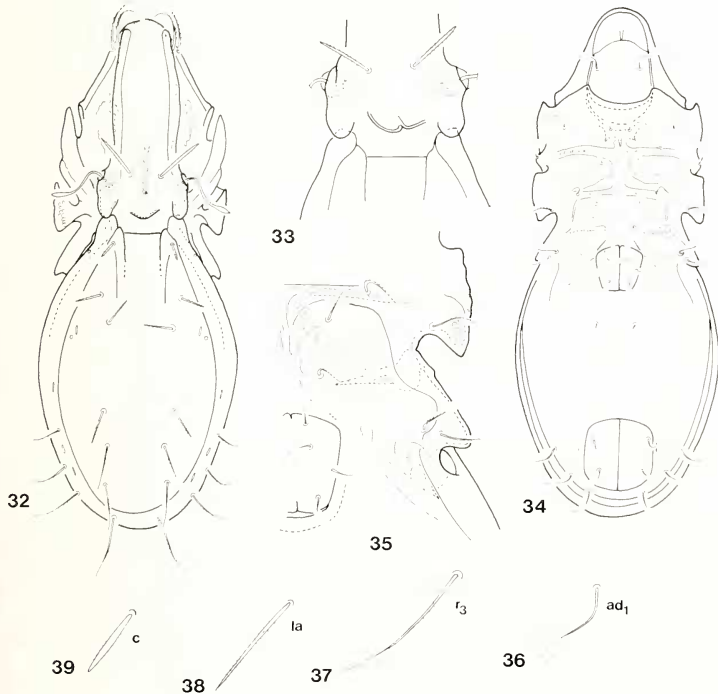
genus *Congocephus* Balogh, 1958; however, no median transverse elevation on the prodorsum is present. It is distinguished from all heretofore known species by the half-moon-shaped formation of its prodorsum and the epimeral setae resembling a willow leaf.

I dedicate the new species to my friend, Dr. B. Hauser, for his intensive collecting work of the tropical soil fauna.

***Acrotocephus diehli* sp. n.**

Measurements: Length: 769-932 μ m, width: 298-365 μ m.

Prodorsum: Rostrum and the lateral part of prodorsum foveolate, interlamellar region smooth. Lamellar and rostral setae thin, setiform, interlamellar setae spiniform, exobothridial setae minute. Rostral and lamellar pairs ciliate, interlamellar setae finely roughened. Lamellae long, running nearly parallel with each other. Their surface well foveolate. Tutorium not observable. Lateral lamelliform expansion strong,



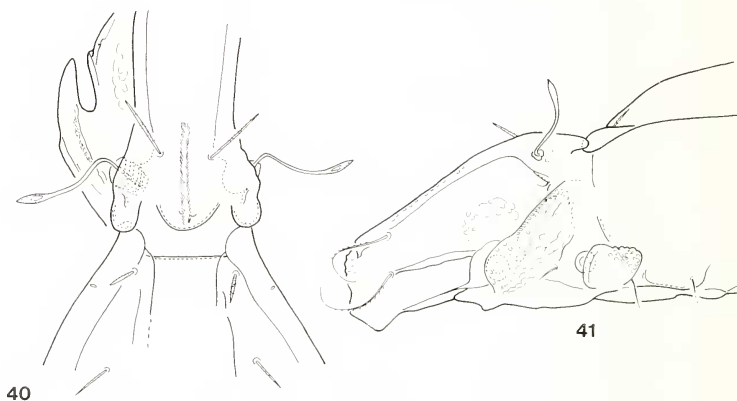
FIGS 32-39.

Acrotocephus diehli sp. n. — 32: body in dorsal view, 33: dorsosejugal region, 34: body in ventral view, 35: posterolateral part of the coxisternal region, 36: seta ad_1 , 37: r_3 , 38: seta $1a$, 39: seta c .

straight and long, reaching to the insertion of rostral setae. Sensillus with a small, fusiform head. The shape of the prodorsal condyles well characterises this species, the lateral pair (co. pl.) large, rounded, the median pair (co. pm.) fused and forming an unpaired median condyle (Fig. 40), in one case the two co. pm. were distinct (Fig. 33).

Notogaster: Dorsosejugal suture straight. Lateral and median condyles fused laterally. From the lateral condyles a costula runs along the body margin, framing the median part of notogaster. Notogastral setae (Fig. 32) of three types, setae *c* slightly fusiform, setae *la*, *lm*, *lp* straight, bacilliform, all others setiform, with filiform distal end. Setae in posteromarginal position gradually becoming longer posteriorly $h_3 < p_3 < p_2 < p_1$. All setae slightly rugose (Figs 37-39).

Lateral part of podosoma: Pedotecta I narrow, its surface foveolate. Pedotecta II-III pustulate (Fig. 41).



FIGS 40-41.

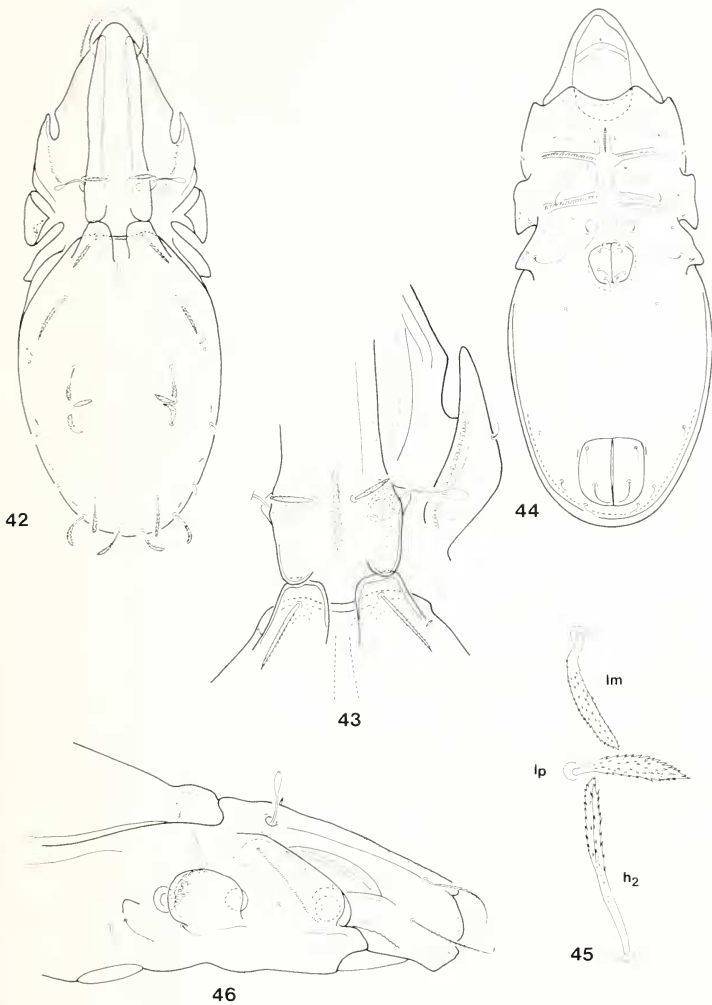
Acrotocephus diehli sp. n. — 40: dorsosejugal region with condyles, 41: lateral part of prodorsum.

Coxisternal region: Apodemes 2 long, reaching to the short sternal ones. Epimeral borders partly observable, bo. 4 absent but some small wrinkles seen in this region (Fig. 35). Epimeral setae of different lengths, setae *3b* and *4b* longer than the other ones, setae *1c* originating far from pedotecta I. All setae slightly ciliate (Fig. 34).

Anogenital region: Genital setae long, simple, similar to other setae in this region, all with flagellate end. Setae *ad*₁ (Fig. 36) only slightly longer than *ad*₃. Lyrifissures *iad* originating in adanal position.

Legs: Type of ultimate setae: L-S-S-S. Solenidium ω_1 much thinner and shorter than ω_2 . Setae *p* on tibia IV and *pv* on tarsus dilate, well ciliate.

Material examined: Holotype: Sum-85/39; 6 paratypes: from the same sample, 3 paratypes: Sum-85/30. Holotype and 6 paratypes: MHNG and 3 paratypes (1227-PO-87): HNHM.



FIGS 42-46.

Otocephalus plumosus sp. n. — 42: body in dorsal view, 43: dorsosejugal region, 44: body in ventral view, 45: median group of the notogastral setae, 46: lateral part of prodorsum.

Remarks: The new species has a pair of characteristic, fused prodorsal median condyles. Therefore it stands close to *Acrotocepheus quateorum* Aoki, 1965; however, the latter is distinguished from it by the length of notogastral setae and by the absence of a true tutorium.

I dedicate the new species to Dr. E. W. Diehl, Director of the Humanitas Hospital in Pematangsiantar, and specialist of the Sumatran Lepidoptera, for his intensive help during the collecting trip of the Geneva Museum.

Otocepheus plumosus sp. n.

Measurements: Length: 1263-1360 μm , width: 494-518 μm .

Prodorsum: Rostrum conical, its surface foveolate. Rostral and lamellar setae thin, setiform, former one shorter. Both pairs with short cilia. Lamellae wide, rounded anteriorly, interlamellar region without any sculpture. Interlamellar setae short, clearly fusiform. Sensillus short, with a small clavate head. Two pairs of condyles present, however, the median pairs very weakly developed. Tutorium connected with the lateral lamelliform expansion, which is directed toward the insertion of the rostral setae (Fig. 46).

Notogaster: Dorsosejugal suture concave medially (Fig. 43). Median notogastral condyles (co. nm.) completely reduced, lateral pair (co. nl.) very large and broad. Distance between them shorter than condyles. Notogastral setae very different in length and shape (Fig. 42). Setae *c* and *1a* long, slightly fusiform, setae *1m*, *1p* and *h₂* composing a characteristic group medially (Fig. 45), all well dilate, phylliform. Setae *h₁*, *p₁* and *p₂* also dilate distally, with a rounded end and ciliate margin. Setae *p₃* and *h₃* short, simple, setiform. Lyrifissures *ips* originating between setae *h₃* and *p₃*.

Lateral part of podosoma: Pedotecta I foveolate anteriorly. Pedotecta II-III symmetrical, fishtail-shaped, its dorsal surface partly pustulate. Sejugal region without any sculpture.

Coxisternal region: Apodemes short, ap. 2 not connected medially. Epimeral setae very different in lengths, setae *1a*, *2a* and *3a* minute, *1c* short and originating far from pedotecta I. Setae *1b*, *3b* and *4b* very long. All setae thin and simple (Fig. 44).

Anogenital region: Genital and aggenital setae thin and simple. All three pairs of adanal setae setiform, well ciliate, $ad_1 > ad_2 > ad_3$. Anterior anal setae thin, short, posterior anal setae (*an₁*) slightly dilate distally, resembling notogastral setae. Lyrifissure *iad* originating in adanal position.

Legs: Type of ultimate setae: L-S-S-S. Solenidium ω_1 as ω_2 of leg I blunt at tip.

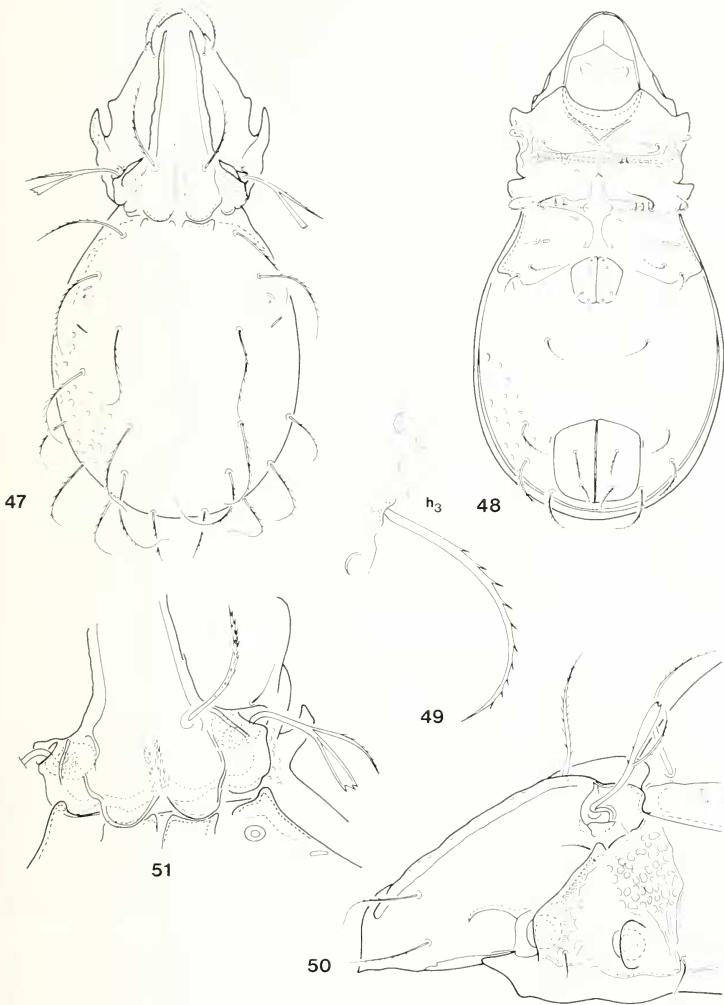
Material examined: Holotype: Sum-85/30; 1 paratype from the same sample. Holotype: MHNG, paratype: (1228-PO-87) HNHM.

Remarks: The new species is well characterized by the dilate, phylliform notogastral setae unknown before in this genus.

Dolicheremaeus duplicatus sp. n.

Measurements: Length: 433-526 μm , width: 211-272 μm .

Prodorsum: Rostral und lamellar setae simple $ro < le$. Interlamellar setae thicker, setiform but blunt at tip. Lamellae narrow, weakly converging anteriorly, surface foveolate. Tutorium very weakly developed, lateral lamelliform expansion short, strongly



FIGS 47-51.

Dolicheremaeus duplicatus sp. n. — 47: body in dorsal view, 48: body in ventral view, 49: seta h_3 , 50: lateral part of prodorsum, 51: dorsosejugal region with condyles.

curved, not reaching insertion of rostral setae (Fig. 47). Sensillus bifurcate, outer branch setiform, inner one dilate distally, with 2-4 spines at the distal end. Prodorsal condyles well developed, co. pm. rounded (Fig. 51).

Notogaster: Median surface smooth, but well foveolate laterally. All notogastral setae curved, well ciliate. All setae — excepting posteromarginal ones — nearly equal in length, h_3 thinner and shorter, p_1 shorter than the others. Notogastral condyles weakly developed, co. nl. angulate, co. nm. concave (!) medially (Fig. 51). Lyrifissures *ip* originating between setae h_3 and p_3 .

Lateral part of podosoma: Pedotecta and a small region between them foveolate. Sejugal surface ornamented by pustules (Fig. 50).

Coxisternal region: Apodemes 2 long, connected medially with comparatively long sternal ones. Ap. sej not touching medially. Epimeral borders mostly observable, however, epimeres 3-4 not framed posteriorly, only some short longitudinal wrinkles or foveolae present here. Some wrinkles visible also on border 2 and sejugal borders (Fig. 48). Epimeral setae ciliate, setae $3b$ longer than the others.

Anogenital region: Genital and aggenital setae simple, thin, anal and adanal ones much thicker and with longer cilia than the preceding ones. Setae ad_1 much thicker and longer than ad_3 . Lyrifissures *iad* in adanal position.

Legs: Type of ultimate setae: L-S-S-S. Solenidium ω_1 of tarsus I slightly thinner and longer than ω_2 . Setae *pv* on tarsus and *p* on tibia IV strongly dilated, plumose.

Material examined: Holotype: Sum-85/39; 8 paratypes: from the same sample. Holotype and 5 paratypes: MHNG and 3 paratypes (1229-PO-87): HNHM.

Remarks: The new species belongs to the species group characterized by the bifurcate sensillus. It is distinguished from all known species of this group by the two asymmetrical branches of the sensillus.

***Dolicheremaeus sumatranus* sp. n.**

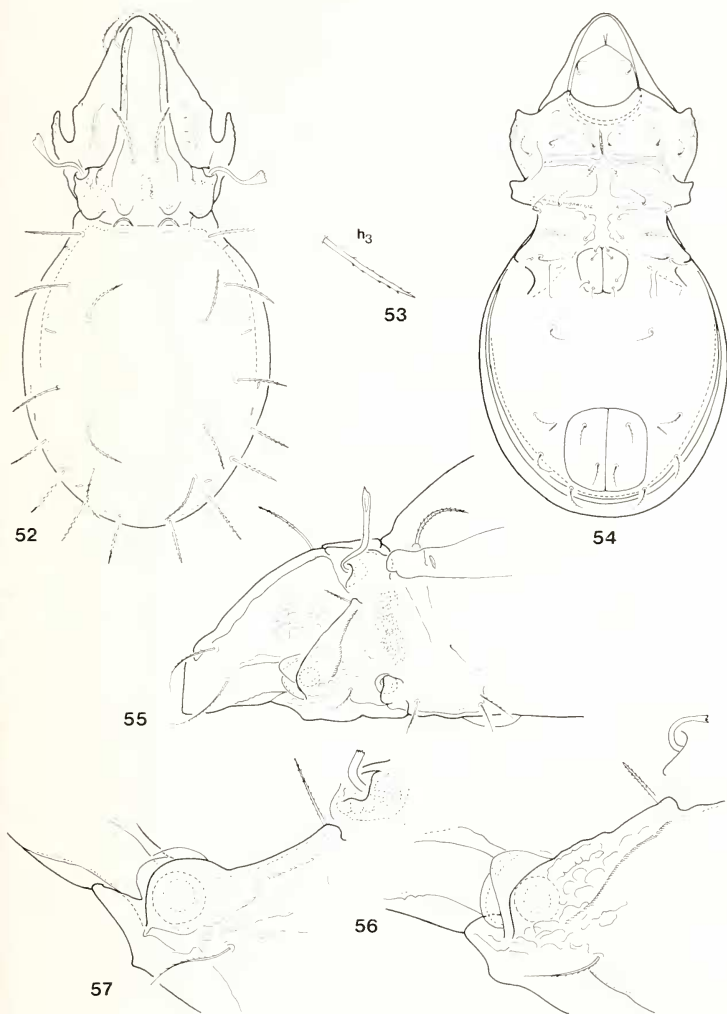
Measurements: Length: 753-859 μm , width: 372-430 μm .

Prodorsum: Rostrum smooth, lamellae strongly foveolate. Some irregular spots present in the lateral part of prodorsum. Tutorium absent, lateral lamelliform expansion weak, short, directed to, but not reaching the insertion of rostral setae. Rostral and lamellar setae nearly equal in length, both pairs thin and setiform. Interlamellar and exobothridial setae bacilliform. Sensillus with a cuneiform head. Prodorsal condyles well separated, both round (Fig. 55).

Notogaster: Surface scarcely foveolate. Dorsosejugal suture straight, both pairs of condyles separated, round. All notogastral setae bacilliform, well ciliate (Fig. 52). Lyrifissures *ih* and *ip* originating anteriorly to setae h_3 (Fig. 53).

Lateral part of podosoma: Anterior margin of pedotecta I straight, surface ornamented by wrinkles. Some wrinkles are also observable beside pedotecta (Fig. 56). Sejugal region pustulate.

Coxisternal region: Apodemes 2 long, medially fused with the short sternal apodeme. Epimeral border mostly well observable (Fig. 54), but epimeres 3-4 open posteriorly. All epimeral seta ciliate.



FIGS 52-57.

Dolicheremaeus sumatranus sp. n. — 52: body in dorsal view, 53: seta h_3 , 54: body in ventral view, 55: lateral part of prodorsum, 56: pedotecta I.

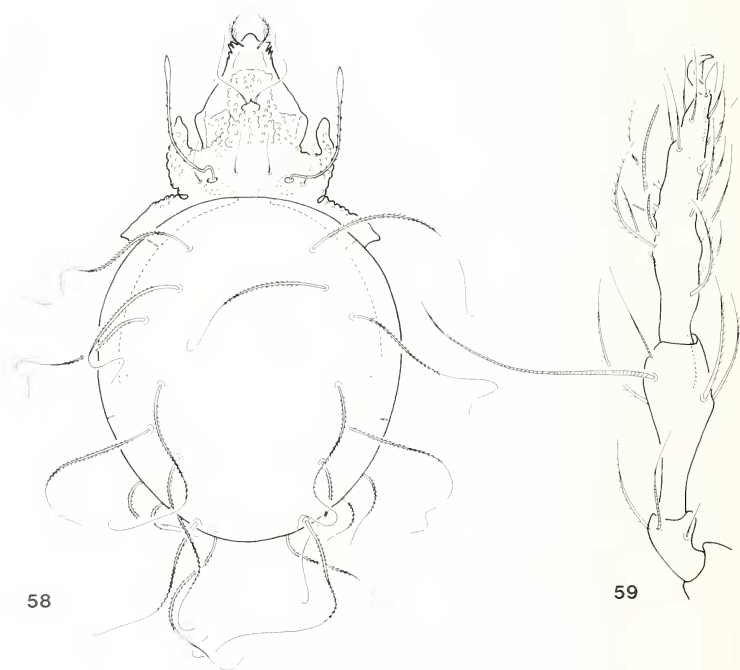
Dolicheremaeus singaporensis Mahunka, 1989 — 57: pedotecta I.

A n o g e n i t a l r e g i o n : Ventral plate smooth. Genital and aggenital setae thin and simple. Anal and adanal ones strong, bacilliform and well ciliate. Lyrifissures *iad* far removed from anal aperture, opening in apoanal position.

L e g s : Type of ultimate setae: L-L-L-L, but all setae *u* very short! Solenidium ω_1 much thinner than ω_2 . Setae *pv* on tarsus IV and *p* on tibia IV well dilate, plumose.

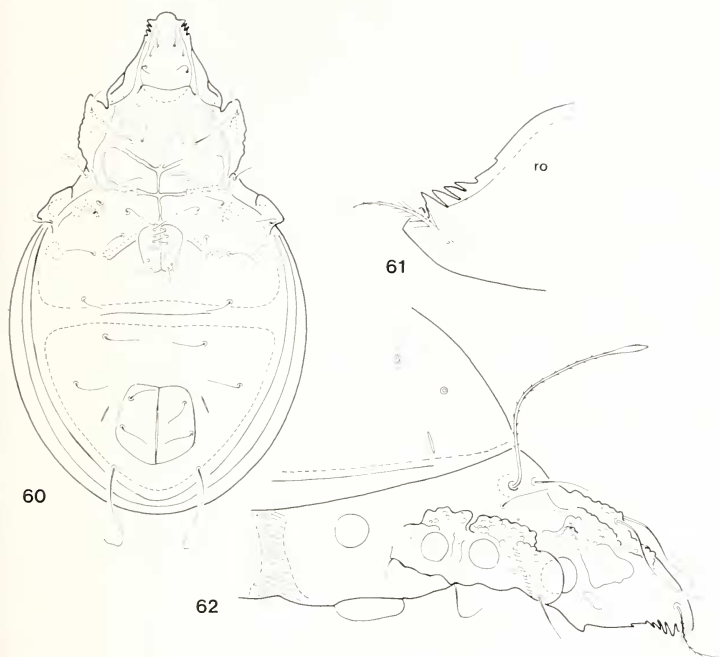
M a t e r i a l e x a m i n e d : Holotypus: Sum-85/39; 12 paratypes: from the same sample; 3 paratypes: Sum-85/49. Holotypus and 10 paratypes: MHNG and 5 paratypes (1230-PO-87): HNHM.

R e m a r k s : The new species stands very near to the recently, described species *Dolicheremaeus singaporensis* Mahunka, 1989 from Singapore (MAHUNKA 1989). The following characters clearly distinguish the two forms. Therefore, I consider them as independent species and not only as subspecies.



FIGS 58-59.

Rhynchoppia widagdoi sp. n. — 58: body in dorsal view, 59: leg I.



FIGS 60-62.

Rhynchoppia widagdoi sp. n. — 60: body in ventral view, 61: rostral teeth, 62: lateral part of prodorsum.

singaporensis Mahunka, 1989

1. Anterior margin of pedotecta strongly arched (Fig. 57), surface smooth.
2. Ventral plate with a strong sculpture.
3. Adanal and anal setae long, ad_3 longer than distance between ad_3 and ad_2 .

sumatranus sp. n.

1. Anterior margin of pedotecta straight (Fig. 56), surface ornamented by alveoli and wrinkles.
2. Ventral plate without any sculpture.
3. Adanal setae short, ad_3 shorter than distance between ad_3 and ad_2 .

***Rhynchoppia widagdoi* sp. n.**

Measurements: Length: 486-535 μm , width: 285-321 μm .

Prodorsum: Rostrum nasiform, laterally with 4 long teeth on either side (Fig. 61). Rostral and lateral part of prodorsum smooth, medially tuberculate (Fig. 62). Median lamellar knob well developed, lamellar setae arising on it. Lamellar setae curved, with long cilia. Interlamellar and exobothridial setae nearly equal in length. Distal end of sensillus clavate. Basal part of prodorsum without tubercles.

Notogaster: Ten pairs of very long, flagellate notogastral setae present, their median part distinctly ciliate. Setae p_1 small, p_2 and p_3 much shorter than the other ones (Fig. 58).

Lateral part of podosoma: Pedotecta I very large, without tubercles anteriorly. Exobothridial surface, a part of discidium and other surface along the acetabula well tuberculate (Fig. 62).

Coxisternal region: Mentum and other surface smooth. Apodemes and borders weakly developed, bo_3 and 4 completely absent, epimeres III and IV fused, epimeral region open posteriorly. Epimeral setae 3-1-3-3 (BALOGH 1968 reported it to be 3-3-3-3 in *R. sedlaceki*, the type of the genus), setae *1a* and *1b* originating near to each other, *1b* longer than the others (Fig. 60).

Anogenital region: A very strong transversal tectum observable between genital and anal apertures. Genital aperture much smaller than anal one. Six pairs of genital setae present. Adanal setae different in length, ad_1 long and flagellate like notogastral ones, ad_1 and ad_3 simple.

Legs: All tarsi of legs narrow, tubiform, long, not dilated basally. Setal formula of leg. I (Fig. 59): 5-3-6-22-1. Solenidium ω_2 of tarsus I stands behind ω_1 . Setae p' and p'' on tarsi of legs II-IV short and spiniform, two setae on tarsi II-IV dilate, with long cilia.

Material examined: Holotype: Sum-85/39; 1 paratype: from the same sample. Holotype: MHNG and paratype (1231-PO-87): HNHM.

Remarks: The new species stands very near to the type of the genus *Rhynchopria* Balogh, 1968. It is distinguished from the latter by the dilated sensillus, the smaller number of lateral teeth of rostrum and the ratio of the prodorsal setae ($ex = in$ in the new species, $in > ex$ in *R. sedlaceki* Balogh, 1968).

I dedicate the new species to Mr. Widagdo, entomologist in Padangpanjang (Sumatra, Indonesia), for his help during the Sumatra expedition of the Geneva Museum.

Zetomotrichus lienhardi sp. n.

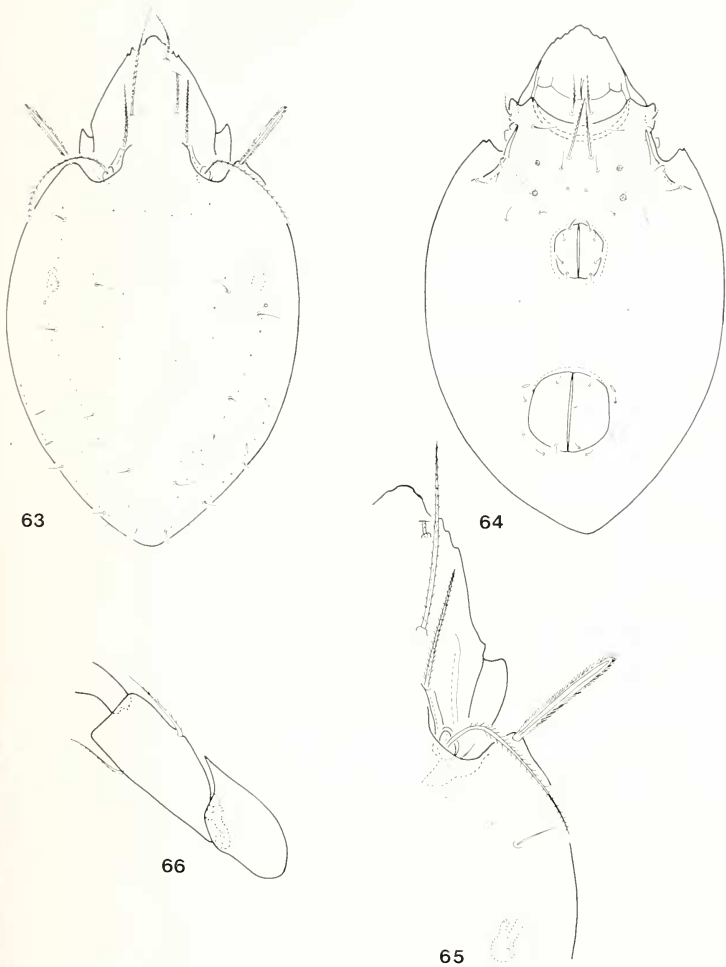
Measurements: Length: 345-390 μm , width: 202-217 μm .

Prodorsum: Rostrum nasiform, beside its rounded apex a deep sinus and 2-3 sharp teeth present on each side. Ratio of prodorsal setae $ex < ro < in < le$. Setae *in* bacilliform and more densely ciliate than setiform lamellar setae (Fig. 63). Lamellae short, parallel with the short median part of the dorsosejugal suture (Fig. 65). Sensillus filiform, bilaterally well ciliate.

Notogaster: Setae *c* pennate, all other notogastral setae thin and simple. Pyriform organs with two tubes anteriorly.

Coxisternal region: Every setae in this region well ciliate. Setae *1a* very long, slightly dilate, setae *hy* on mentum similar to them but shorter. A long custodium present, but discidium small.

Anogenital region: Genital setae conspicuously long, longer than the aggenital ones. Two pairs of anal and three(!) pairs of adanal setae. Setae ad_1 in postanal, ad_2 and ad_3 in adanal position. Lyrifissures *iad* in paraanal position.



FIGS 63-66.

Zetomotrichus lienhardi sp. n. — 63: body in dorsal view, 64: body in ventral view, 65: anterolateral part of body, 66: trochanter of leg IV.

Legs: Form and chaetotaxy of legs I-III identical with those of *Zetomotrichus lacrimans* Grandjean, 1934. However, the trochanter of leg IV has a much longer but narrower anterior extension and the tarsal setae *in* also thick, like *tc*". Cilia on setae *tc* and *ft*" much longer than what Grandjean illustrated for *Z. lacrimans*.

Material examined: Holotype: Sum-85/54; 1 paratype: from the same sample. Holotype: MHNG and paratype (1232-PO-87): HHNM.

Remarks: The new species resembles *Z. lacrimans*, the type of the genus *Zetomotrichus* Grandjean, 1934; however, the new species has three pairs of adanal setae, its rostrum is more protruding anteriorly and the pyriform organs have two tubes.

I dedicate the new species to Dr. C. Lienhard (Geneva), the renowned specialist of Psocoptera, member of the Sumatra expedition of the Geneva Museum, for his help in collecting this interesting material.

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